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LONG BANGA & ADJACENT AREA

HEART OF BORNEO INITIATIVE

COMPARISON ON THE OCCURRENCES OF THE GENUS *MAPANIA* AUBLET (CYPERACEAE) FROM THE HEART OF BORNEO (HoB)

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Abstract

A comparison on the occurrences of the genus Mapania, family Cyperaceae from four selected areas of the Heart of Borneo (HoB) Project; namely Lanjak Entimau Wildlife Sanctuary (LEWS), Ulu Mentawai, Mulu National Park (UMMNP), Ulu Baleh National Park (UBNP) and Long Banga, Ulu Baram, Miri were conducted from the year 2008 until 2016. A total of 29 taxa representing by 24 species and 3 in-determined species were collected and identified from the four selected areas. The number recorded was considered high with 58.5% of the total number recorded for Sarawak. Only three taxa, viz. M. cuspidata var. cuspidata, M. meditensis *and* M. palustris *were recorded occurred in all four selected sites. Whilst,* M. sapuniana, M. ballehensis, M. kipas *and* M. mirae *were identified as hyper-endemic;* M. sapuniana *from LEWS and the following three were from UBNP.*

Keywords*: Cyperaceae, Mapania, Lanjak Entimau Wildlife Sanctuary, Ulu Mentawai Mulu National Park, Ulu Balleh National Park, Long Banga*

Introduction

Cyperaceae is the third largest family in the monocotyledons and seventh-largest family in the angiosperms with 106 genera and 5387 species (Govaerts *et al.* 2007; Shabdin & Meekiong, 2012). They form a huge morphologically diverse, geographically widespread, and economically important family (Naczi, 2005). The genus *Mapania* first described by Aublet in 1775 and allies form one of the two branches at the base of the Cyperaceae phylogenetic tree (Shabdin & Meekiong, 2012). This genus is widely distributed in tropical regions from Central and South America, Western and Eastern Africa, Seychelles, parts of tropical Asia, Indonesia, Malaysia, the Pacific Islands and Northern Australia (Simpson, 1992; Meekiong *et al.* 2011). The *Mapania* species are an important component of the herb layer in tropical rainforests and is valued as an ethnobotanical plant for the indigenous folks. Several *Mapania* species are known to be used in basket and mat-making, while others are known to local people for medicinal purposes such as fever remedy.

Simpson (1992) recorded only 25 species from Sarawak with 12 of them are endemic. Subsequently, Shabdin *et al.* (2013a, 2013b) added two species, *M. sapuaniana* and *M. multiflora* and followed by another two species by Shabdin *et al.* (2016) and Miraadila and Shabdin (2016); *M. kadimiana* and *M. meekiongii* respectively to make a total of 29 species for Sarawak. Later, Miraadila *et al.* (2016a, 2016b) added another 11 new species and one new record into the list to make a total of 40 species. Current account for the genus *Mapania* is comprising of 122 species worldwide and the greatest diversity in the genus occurs in Borneo of which 70% of the total

number of species are endemic (Miraadila *et al*. 2016a). However, knowledge on the *Mapania* in Borneo, particularly the pastoral forests of the so-called the Heart of Borneo areas of Sarawak is limited due to lack of studies.

Materials and Methods

Mapania samples were collected from Lanjak Entimau Wildlife Sanctuary (LEWS) during the recce trips and scientific expedition in 2008; from Ulu Mentawai (including Ulu Sg. Mendalam) of Mulu National Park (UMMNP) in 2012 expeditions, from Ulu Baleh National Park (UBNP) in 2015 scientific expedition and Long Banga in a recent expedition (2016). The samples were identified in the Sarawak Forestry Department Herbarium (SAR), Herbarium of Universiti Malaysia Sarawak (HUMS) and books, monographs and other available references.

Results and Discussion

A total of 29 taxa representing by 24 species and three in-determined species were collected and identified from the four selected areas of the HoB project areas. The number recorded was considered high with 70% of the total number recorded for Sarawak. List of the species and comparison on the occurrences of the species from the four selected areas were showed in Table 1. The number of *Mapania* from Long Banga was the lowest among the four selected sites with only seven species recorded compared with UBNP with ten species, UMMNP and LEWS with 15 and 16 respectively. The occurrences however, show great variances within the four locations. Out of 29 total taxa, only three taxa were recorded to be occurred in all locations, viz. *M. cuspidata* var. *cuspidata*, *M. meditensis* and *M. palustris.* Whilst four

of the species were recognized as hyper-endemic; *M. sapuaniana* only recorded from Sg. Joh of the LEWS and *M. ballehensis, M. kipas* and *M. mirae* from UBNP.

Field observations suggest that the number of *Mapania* species from the two locations, UBPNP and Long Banga are lower compared to LEWS and UMMNP because of environmental factors. Most of the surveyed areas in both locations were either old secondary forests or disturbed due to the logging activities. While the LEWS and UMMNP were pristine and undisturbed forests. The results support that the *Mapania* species are herbaceous dwelling well in the deep shaded or damp and humid places near streams or river bank of undisturbed forests. Another factor that might influence the number of species is the altitudinal factor. LEWS and UMMNP were considered lowland with most of the surveyed areas were positioned below 400 m altitudes, whereas UBPNP and Long Banga were located above 400 m altitudes.

However, it is presumed that an altitudinal might as well play a role of species differentiation. For example, four species from the UBPNP, *M. angustifolia, M. ballehensis, M. kipas* and *M. mirae* were collected at above 400 m altitudes and never encountered below.

It was concluded that the occurrences of the genus *Mapania* from the four selected localities of the HoB areas were considered diverse and high density with 24 species out of 41 total numbers of species recorded in Sarawak (Appendix 1). We strongly believed that the number of species from the HoB areas probably higher as many places is yet to be surveyed.

Table 1: Comparison on occurrences of the *Mapania* species from four selected areas in the Heart of Borneo (HoB Project); Long Banga, LEWS UMMNP and UBNP.

***Mapania* species**	**Long Banga**	**UMMNP**	**LEWS**	**UBNP**
M. angustifolia Uittien				√
M. ballehensis Miraadila, Shabdin & Meekiong				√
M. bancana (Miq.) Benth. & Hook.f. ex B.D. Jackson		√		
M. borneensis Merr.			√	
M. caudata Kuk	√			√
M. cuspidata (Miq.) Uitten var. *angustifolia*		√	√	
M. cuspidata (Miq.) Uitten var. *cuspidata*	√	√	√	√
M. cuspidata (Miq.) Uitten var. *petiolata*		√	√	
M. debilis C.B. Clarke ex Ridl.		√		
M. enodis (Merr.) C.B. Clarke			√	
M. hispida D.A. Simpson		√		
M. kipas Miraadila, Shabdin & Meekiong*				√
M. latifolia Uitten	√	√	√	
M. longiflora C.B. Clarke			√	
M. meditensis D.A. Simpson	√	√	√	√
M. mirae Shabdin & Meekiong*				√

M. monostachya Uitten		√		√
M. obscurifolia D.A. Simpson			√	
M. palustris (Hassk. ex Steud) F.-Vill. var. *palustris*	√	√	√	√
M. richardsii Uitten			√	
M. sapuaniana Shabdin*			√	
M. squamata (Kurz.) C.B. Clarke	√			
M. sessilis Merr.		√	√	
M. sumatrana (Miq.) Benth. ssp. *pandanophylla* (F. Muell.) D.A. Simpson			√	
M. tenuiscapa C.B Clarke		√		
M. wallichii C.B. Clarke		√	√	√
Mapania sp. nov.1 (*closed to M. palustris*)	√			
Mapania sp.42			√	
Mapania sp.43		√		
Total No. of species	**7**	**15**	**16**	**10**

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